



Dart Aerospace Ltd.  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

**D412-664-403**  
**Job Sheet 171064**



*Sold*

Part No: D412-664-403

Job Qty: 1 ea

Part Name: 412 Stainless Steel Aft Crosstubes - High



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 1/26/18

Job Tracking No:

Due Date: 1/31/18

Created By: Marie Lajeunesse

Type: Stock

Description:

Note: D412-664-443 REV.B/ IIN-D212-664 REV.I IPP REV.A 13.10.25 NEW ISSUE DD VERF:JLM IPP Rev.B  
17.06.26 As per Dwg/Chg/PAR16-545 DP Verify DD

Ship Via:

### Bill of Materials

### Job Routing

| Op No | Operation           | Qty   | Start Date | Due Date | Standard  |         | Workcenter/Supplier   |           | Sign-off        |
|-------|---------------------|-------|------------|----------|-----------|---------|-----------------------|-----------|-----------------|
|       |                     |       |            |          | Setup hrs | Run Hrs | Workcenter / Supplier | Lead Time |                 |
| 90    | Start up Operation  | 1 Ea  |            | 1/30/18  | 0.00      | 0.00    | Start Up Crosstubes-2 |           | GP              |
| 110   | CNC Bend Crosstubes | 1 pcs |            | 1/30/18  | 0.00      | 5.88    | CNC Bend Crosstube    |           | GP/DP2          |
| 127   | QC                  | 1 pcs |            | 1/30/18  | 0.00      | 0.00    | QC15                  |           | 38              |
| 128   | Crosstubes          | 1 pcs |            | 1/30/18  | 0.00      | 2.78    | Crosstubes-2          |           | GP/DP2          |
| 130   | Crosstubes          | 1 pcs |            | 1/30/18  | 0.00      | 2.78    | Crosstubes-2          |           | GP/DP2          |
| 140   | QC                  | 1 pcs |            | 1/30/18  | 0.00      | 0.00    | QC6                   |           | 38              |
| 174   | Outsource           | 1 pcs |            | 1/30/18  | 0.00      | 0.00    | Outsource2            |           | 108 FEB 15 2018 |
| 176   | Packaging           | 1 pcs |            | 1/30/18  | 0.00      | 0.00    | Packaging2            |           | 108 FEB 15 2018 |
| 178   | QC                  | 1 pcs |            | 1/30/18  | 0.00      | 0.00    | QC5                   |           | 38              |
| 180   | SprayPaint          | 1 pcs |            | 1/30/18  | 0.00      | 2.70    | Spray Paint           |           | DI 19-02-18     |
| 190   | QC                  | 1 pcs |            | 1/30/18  | 0.00      | 0.00    | QC14                  |           | 38              |
| 200   | Crosstubes          | 1 pcs |            | 1/31/18  | 0.00      | 2.78    | Crosstubes-2          |           | DI 18-02-21     |
| 210   | QC                  | 1 pcs |            | 1/31/18  | 0.00      | 0.00    | QC5                   |           | 38              |
| 220   | Packaging           | 1 pcs |            | 1/31/18  | 0.00      | 0.00    | Packaging1-4          |           | DI 18-02-21     |
| 230   | QC                  | 1 pcs |            | 1/31/18  | 0.00      | 0.00    | QC4                   |           | 38              |
| 235   | DC                  | 1 pcs |            | 1/31/18  | 0.00      | 0.00    | DC                    |           | Smb             |
| 240   | Packaging           | 1 pcs |            | 1/31/18  | 0.00      | 0.00    | Packaging3-2          |           | Smb 19-02-18    |
| 250   | QC21-FG             | 1 Ea  |            | 1/31/18  | 0.00      | 0.00    | QC21                  |           | 21 MAR 05 2018  |

Part Op 110 - Bend tube as per Dwg D412-664-443 using CNC bender program D412-664-443 \*\*\*USE (4) DT9824 SHIM BLOC  
Descriptions: TO CHECK STRAIGHTNESS\*\*\*\*

127 - \*\*\*MARK CUT LINES\*\*\*

128 - CUT TUBE AT HEIGHT ON FAI SHEET VERF HEIGHT 24.375 BY QC 15 LEVEL INSPECTOR JW

VERF TWIST 1.21 BY QC15 LEVEL INSPECTOR JW

130 - 1- Drill Tube as per Dwg D412-664-443 Using DT8550/8551 Drill Jigs, Set-up drill table as per QSI 010 2 -Deburr  
Engrave Part # and Batch # as per Dwg D412-664-443 4-Remove all marks from tube within limits of D412-664-443  
DWG.

174 - ISSUE P/O TO ACCUREN: D39037

180 - \*\*\*USE AXALTA 230S PRE-TREATMENT AS PER QSI005\*\*\* AXALTA BATCH: B138021 \*\*\* WEAR  
LATEX GLOVES WHEN HANDLING CROSSTUBE\*\*\* \*\*VERIFY BY \_\_\_\_\_ BATCH # TO MATCH W/O

\*\*\*VERIFY BY \_\_\_\_\_ PART # TO MATCH W/O \*\*\*MASK SCRIBE

B# & P# AND VERIFY\*\*\* 1-Prime inside & outside cross tube as per QSI 005 4.2 BATCH: 138687 2- Apply matte  
clear coat to underside of cross tube per QSI005 4.2 BATCH: 10-38689 3- MASK UNDERSIDE OF

CROSSTUBE AS SHONE ON DWG BEFORE PAINTING 4 -Paint Outside of Tube as per Dart QSI 005 4.2 BATCH:

138741 5-Remove masking

200 - 1- \*\*\*\*\*LAY DOWN CORSTUBE ON TABLE AND PUT DT10302 PINS IN SADDLE HOLE FACING UP, USE

**D412-664-403 / 171064 / S039705**

**DART**  
AEROSPACE  
**S039705**

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CANADA  
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**412 Stainless Steel Aft Crosstubes - High**

**PART NO: D412-664-403**  
**Original Serial #: S039705**

**Revision:**  
**Operation:**  
**Change No:**

**Start up Operation** 02/06/18  
**CHG002** Job No: 171064



HOLE IN TAPE MEASURE TO PUT IN PINS FOR LOCATING CENTER OF CROSSTUBE. \*\*\*\*\* Install center support using scotch-weld DP460 per QSI 015, as per DWG. note 12. Install supports clamps as per Dwg D412-644-443. .  
 \*\*\*ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT\*\*\* Torque clamps on support to 80-100 IN-LBS AS PER DWG. A/R scotch-weld DP460 BATCH #: \_\_\_\_\_ EXP DATE: \_\_\_\_\_ 2- \*\*IF NOT ALREADY PRESENT ON CHAFFING SHEILD.\*\* Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chafing shield and let cure per manufacturer's instructions. Install prosealed chafing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps. Install and torque clamps on chafing shield to 40-50 IN-LBS AS PER DWG. A/R Proseal 890 Batch: 138708 EXP DATE: 5/18 AFTER FINISH CURE TIME 24H START CURE TIME: 18-02-21 FINISH CURE TIME: 18-02-22 PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.  
 210 - PRIOR TO PACKAGING RE-CHECK TORQUE ON CLAMPS AFTER CURED FOR 24H.  
 235 - Photocopy bluefile & type labels per PPPD412-664-403 CHG002  
 240 - Identify and pack for shipping as per PPPD412-664-443 Location: \_\_\_\_\_ PPP Rev: \_\_\_\_\_

#### Job BOM

| Part / Item     | Component Name           | Quantity      | Operation             | Container |
|-----------------|--------------------------|---------------|-----------------------|-----------|
| D412-664-443TRN | Crosstube Turning Detail | 1 Ea (1 ea)   | 90-Start up Operation |           |
| D4910-1         | Chaffing Shield          | 2 Ea (2 ea)   | 200-Crosstubes        |           |
| MS21920-26      | Clamp                    | 4 Ea (4 ea)   | 200-Crosstubes        |           |
| D5380-1         | Support                  | 1 Ea (1 ea)   | 200-Crosstubes        |           |
| D5380-3         | Support Base             | 1 Ea (1 ea)   | 200-Crosstubes        |           |
| NAS1805-4P      | Nut                      | 8 pcs (8 ea)  | 200-Crosstubes        |           |
| NAS6704-21      | Bolt                     | 8 pcs (8 ea)  | 200-Crosstubes        |           |
| AN6-40A         | 3/8-24 Bolt X 3" Long    | 4 Ea (4 ea)   | 220-Packaging         |           |
| AN6-41A         | Bolt                     | 2 Ea (2 ea)   | 220-Packaging         |           |
| MS21042L6       | Nut                      | 6 Ea (6 ea)   | 220-Packaging         |           |
| NAS1149D0663J   | Washer                   | 18 Ea (18 ea) | 220-Packaging         |           |

#### Job Allocations

| Operation             | Component Part  | Required | Inventory | Allocated |
|-----------------------|-----------------|----------|-----------|-----------|
| 90-Start up Operation | D412-664-443TRN | 1        | 5         | 0         |
| 200-Crosstubes        | D4910-1         | 2        | 6         | 0         |
|                       | D5380-1         | 1        | 10        | 0         |
|                       | D5380-3         | 1        | 10        | 0         |
|                       | MS21920-26      | 4        | 30        | 0         |
|                       | NAS1805-4P      | 8        | 23        | 0         |
|                       | NAS6704-21      | 8        | 24        | 0         |
| 220-Packaging         | AN6-40A         | 4        | 112       | 0         |
|                       | AN6-41A         | 2        | 46        | 0         |
|                       | MS21042L6       | 6        | 496       | 0         |
|                       | NAS1149D0663J   | 18       | 1,250     | 0         |

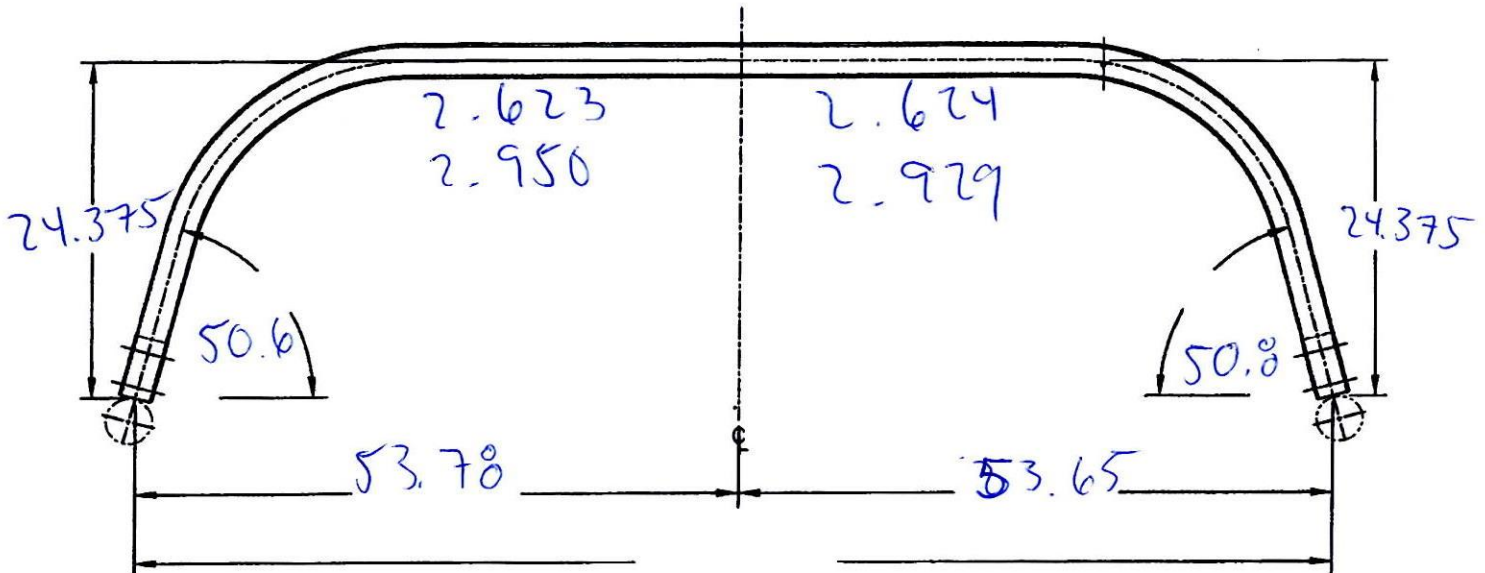
#### Part Specifications

Specifications could not be found.

Plex 1/26/18 12:50 PM Dart.lajeunesse.marie

|                                              |                         |                     |              |
|----------------------------------------------|-------------------------|---------------------|--------------|
| <b>DART AEROSPACE LTD</b>                    |                         | <b>Work Order:</b>  | 171024       |
| <b>Description:</b> Crosstube High Aft (412) |                         | <b>Part Number:</b> | D412-664-403 |
| <b>Inspection Dwg:</b> D412-664-443          | <b>Rev:</b> AB 18.01.24 | <b>Page 1 of 1</b>  |              |

| Required Dimension | Min    | Max    |
|--------------------|--------|--------|
| Height             | 24.12  | 24.62  |
| 1/2 Span           | 53.56  | 53.82  |
| Angle              | 49°    | 52°    |
| Total Span         | 107.12 | 107.64 |
| Bending Passes     | 8      | --     |
| Crushing           | --     | 7%     |



|                       | Side A | Side B |
|-----------------------|--------|--------|
| <b>Bending Passes</b> | 4      | 5      |
| <b>Crushing</b>       | 5.2%   | 5.5%   |
| <b>Comments</b>       |        |        |
|                       |        |        |
|                       |        |        |
|                       |        |        |
|                       |        |        |

|                        |             |
|------------------------|-------------|
| <b>QC15 Inspection</b> | DAS 38      |
| <b>Date</b>            | FEB 07 2018 |

| Rev | Date     | Change    | Revised by | Approved |
|-----|----------|-----------|------------|----------|
| A   | 14.07.08 | New Issue | KJ         | UP       |



| Item | Qty | Part Number         | Description                     |
|------|-----|---------------------|---------------------------------|
|      | 443 |                     |                                 |
| 1    | X   | D412-664-443        | CROSSTUBE ASSEMBLY (412 HI AFT) |
| 2    | 1   | D6020-132           | CROSSTUBE MATERIAL              |
| 3    | 2   | D4910-1             | CHAFING SHIELD                  |
| 4    | 1   | D5380-1             | SUPPORT                         |
| 5    | 1   | D5380-3             | SUPPORT BASE                    |
| 6    | 4   | MS21920-26          | CLAMP                           |
| 7    | 8   | NAS1805-4P          | NUT                             |
| 8    | 8   | NAS6704-21          | BOLT                            |
| 9    | A/R | SCOTCH-WELD DP460   | EPOXY ADHESIVE, 3M SCOTCH-WELD  |
| 10   | A/R | PROSEAL 890 OR 1422 | SEALANT                         |

#### GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6020-132  
FINISHED LENGTH = 130.10±0.060 (BEFORE BENDING/TRIMMING)
- 2) FINISH: PREPARE TUBE PER QSI 005 SECTION 4.1.4  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
APPLY MATTE CLEAR COAT TO UNDERSIDE OF CROSSTUBE PER DART QSI 005 4.2  
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C6-2, HATCHED AREA)  
PAINT OUTSIDE PER DART QSI 005 4.2  
AFTER PAINTING, REMOVE MASKING
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART P/N "D412-664-443" AND B/N ON INSIDE OF CUFF PER DART QSI 044 6.4 (VIBRATING STYLUS)
- 7) WEIGHT: 87.8 lb FINISHED WEIGHT
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.

#### BENDING

- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R35 BEND AND 6% (BASED ON O.D.) ON REMAINING TUBE.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

#### ASSEMBLY

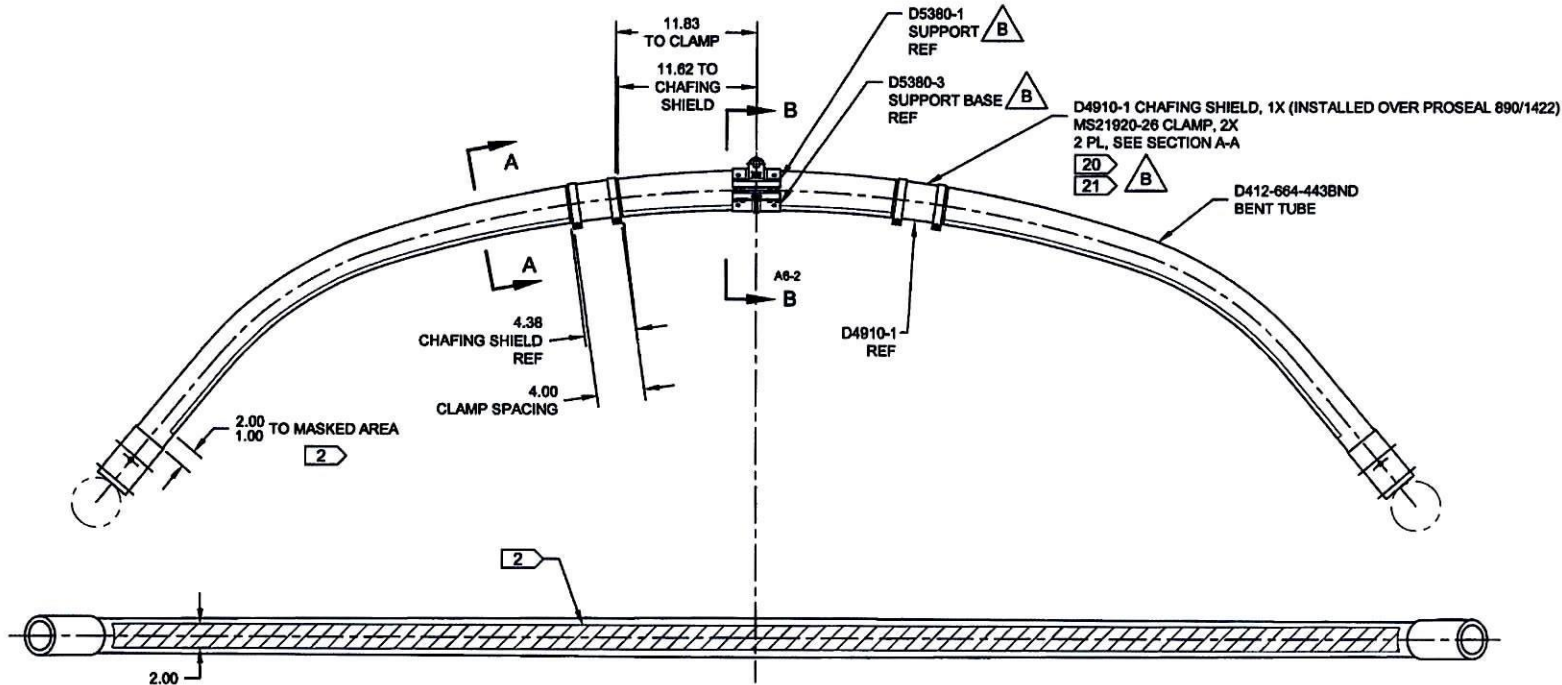
- 12) LOCATE THE D5380-1/3 SUPPORTS ONTO THE CROSSTUBE AS SHOWN IN THE ASSEMBLY DETAIL.
- 13) ABRASE THE MATING SURFACES OF THE CROSSTUBE AND D5380-1/3 SUPPORT HALVES WITH 180-GRIT SANDPAPER. SATURATE A CLEAN CLOTH WITH MEK, 4105S WASH'N'WIPE DEGREASER OR EQUIVALENT AND WIPE CLEAN UNTIL THERE IS NO RESIDUE.
- 14) APPLY A 0.04" TO 0.07" THICK LAYER OF 3M DP460 ADHESIVE ONTO THE CONCAVE SURFACE OF THE D5380-1 SUPPORT AND THE D5380-3 SUPPORT BASE.
- 15) INSTALL D5380-1 SUPPORT ONTO THE CROSSTUBE AS SHOWN IN THE ASSEMBLY DETAIL AND INSTALL QTY (2) NAS6704-21 BOLTS INTO OPPOSING CORNERS OF THE D5380-1 SUPPORT. ALIGN THE BOLTS WITH THE HOLES ON D5380-3 SUPPORT BASE AND INSTALL ONTO THE CROSSTUBE.
- 16) INSTALL THE REMAINING QTY (8) NAS6704-21 BOLTS AND QTY (8) NAS1805-4P NUTS, THEN EVENLY TORQUE THE NUTS IN A CRISS-CROSS PATTERN TO 80-70 IN-LBS. ENSURE A MINIMUM OF 1.5 THREADS ARE IN SAFETY.
- 17) WIPE OFF EXCESS ADHESIVE USING A CLEAN CLOTH SATURATED WITH MEK, 4105S WASH'N'WIPE DEGREASER OR EQUIVALENT
- 18) ALLOW DP460 ADHESIVE TO CURE FOR 24 HOURS.
- 19) FILLET SEAL THE EDGES OF THE D5380-1/3 SUPPORT HALVES WITH PROSEAL PR1422 B1/2 OR PR890 B1/2 ALLOW PROSEAL TO CURE FOR 24 HOURS.
- 20) IF NOT ALREADY PRESENT ON D4910-1 CHAFING SHIELD, APPLY A 0.015" TO 0.020" THICK COAT OF PROSEAL 890/1422 ON INSIDE CONCAVE SURFACE OF D4910-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS.
- 21) RECOAT THE D4910-1 CHAFING SHIELD WITH 0.015"-0.020" OF PROSEAL 890/1422 AND IMMEDIATELY INSTALL ONTO THE CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS. ENSURE THE D4910-1 CHAFING SHIELDS ARE WRAPPED TIGHTLY.
- 22) TORQUE CLAMPS ON D4910-1 CHAFING SHIELD 40 TO 50 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON MS21920-26 CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

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180126

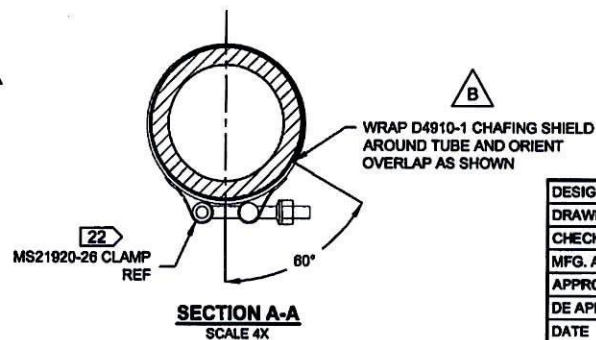
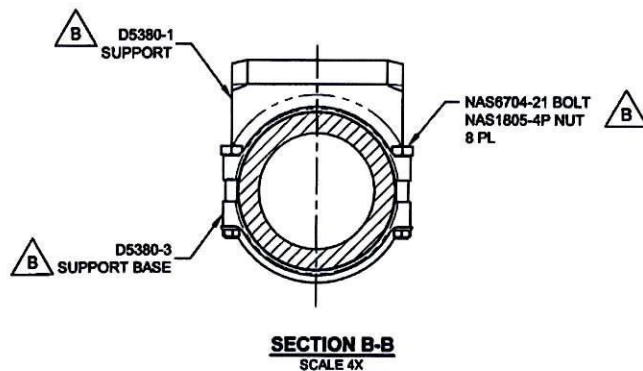
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2017 JUN 21  
ECN 17-593

|            |                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                          |              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| B          | ADD ITEMS 4, 5, 7, AND 8. DELETED ITEMS D4909-1, MS21920-28 & D3595-063-530. NOTE 2 UPDATED FOR TUBE FINISH. ALL ASSEMBLY NOTES REWRITTEN. SHEET 2 SECTION A-A ANGLE DIM ADDED FOR CHAFING SHIELD INSTALLATION. ASSEMBLY DETAIL AND SECTION B-B UPDATED FOR INSTALLATION OF D5380-1/3. | AJS                                                                                                                                                                                                                                                                      | 16.11.03     |
| A          | NEW ISSUE                                                                                                                                                                                                                                                                              | CP                                                                                                                                                                                                                                                                       | 14.04.01     |
| REV.       | DESCRIPTION                                                                                                                                                                                                                                                                            | BY                                                                                                                                                                                                                                                                       | DATE         |
| DESIGN     | CP                                                                                                                                                                                                                                                                                     | DART AEROSPACE LTD                                                                                                                                                                                                                                                       |              |
| DRAWN      | AJS                                                                                                                                                                                                                                                                                    | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                              |              |
| CHECKED    | M. Kay                                                                                                                                                                                                                                                                                 | DRAWING NO.                                                                                                                                                                                                                                                              | REV. B       |
| MFG. APPR. | [Signature]                                                                                                                                                                                                                                                                            | D412-664-443                                                                                                                                                                                                                                                             | SHEET 1 OF 4 |
| APPROVED   | [Signature]                                                                                                                                                                                                                                                                            | TITLE                                                                                                                                                                                                                                                                    | SCALE        |
| DE APPR.   | [Signature]                                                                                                                                                                                                                                                                            | CROSSTUBE ASSY (412 HI AFT)                                                                                                                                                                                                                                              | NTS          |
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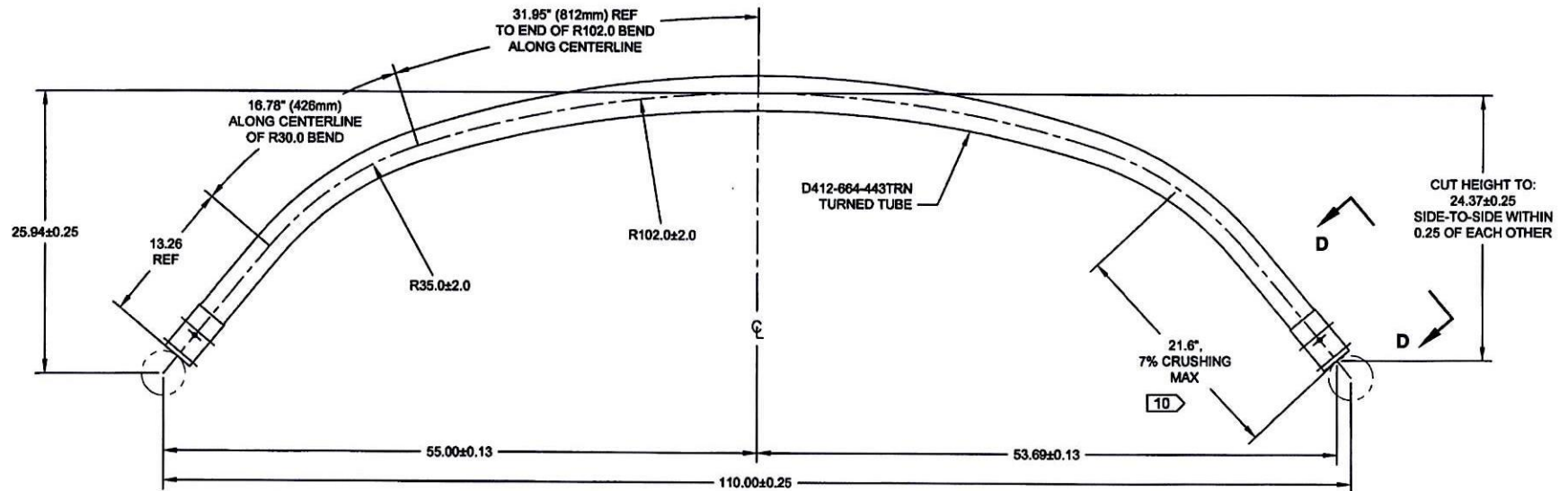


SYM  
D412-664-443  
ASSEMBLY DETAIL



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|            |                    |                                                                                                                                                                                                                                                                           |              |
|------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | CP                 | <b>DART AEROSPACE LTD</b>                                                                                                                                                                                                                                                 |              |
| DRAWN      | AJS                | HAWKESBURY, ONTARIO, CANADA                                                                                                                                                                                                                                               |              |
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| MFG. APPR. | <i>[Signature]</i> | D412-664-443                                                                                                                                                                                                                                                              | SHEET 2 OF 4 |
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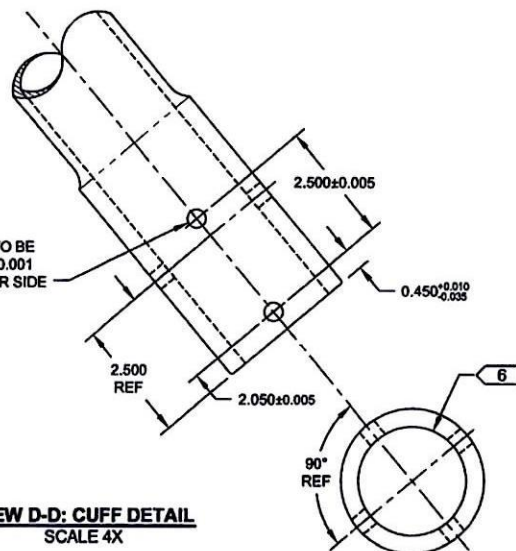


**D412-664-443BND**  
BENDING DETAIL

10

Ø0.386<sup>+0.005</sup><sub>-0.003</sub> HOLE TO BE  
ALIGNED WITHIN ±0.001  
OF HOLE ON OTHER SIDE  
OF CUFF  
2 PL

**VIEW D-D: CUFF DETAIL**  
SCALE 4X

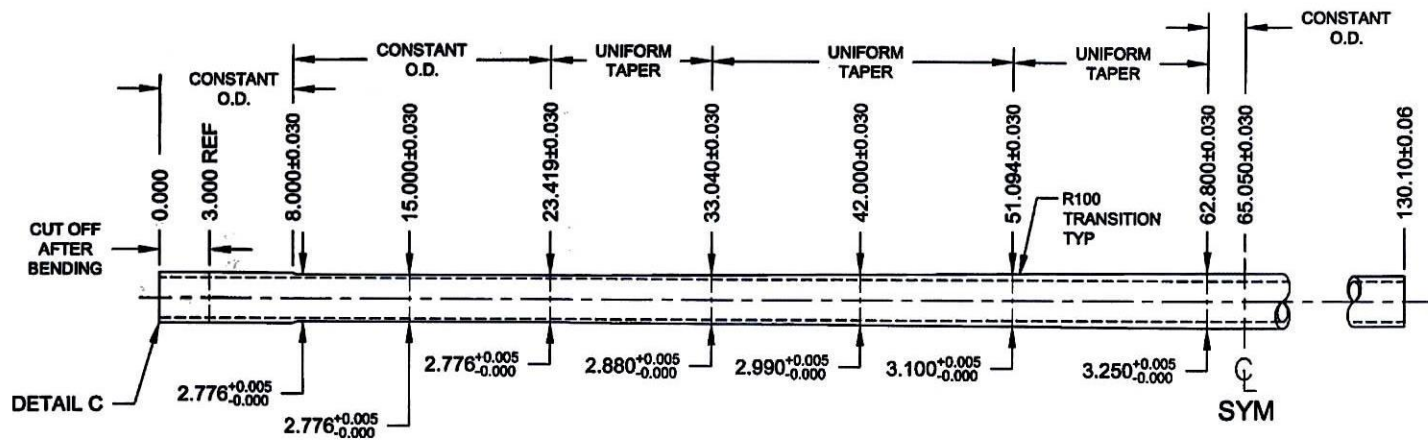


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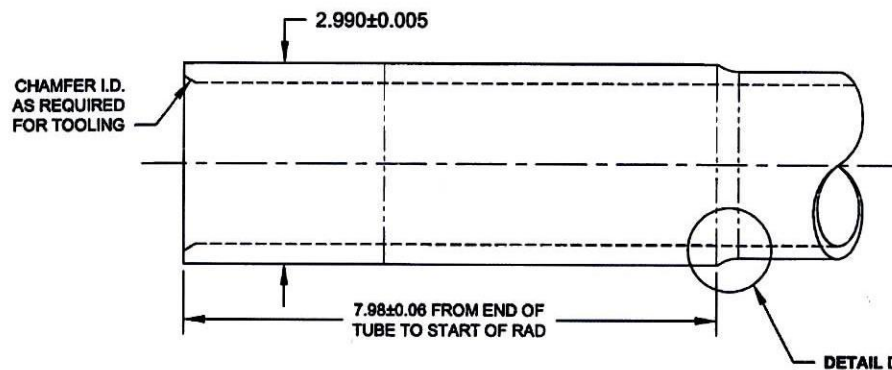
2017 JUN 21

|            |                    |                                                                                                                                                                                                                                                                                                  |              |
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| MFG. APPR. | <i>[Signature]</i> | D412-664-443                                                                                                                                                                                                                                                                                     | SHEET 3 OF 4 |
| APPROVED   | <i>[Signature]</i> | TITLE                                                                                                                                                                                                                                                                                            | SCALE        |
| DE APPR.   | <i>[Signature]</i> | CROSSTUBE ASSY (412 HI AFT)                                                                                                                                                                                                                                                                      | NTS          |
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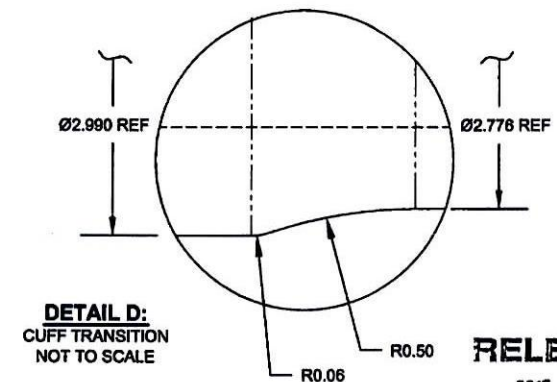




**D412-664-443TRN**  
TURNING DETAIL



**DETAIL C:**  
CUFF TRANSITION  
SCALE 4X



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2017 JUN 21 *ap*

|                                                                                                                                                                                                                                 |                    |                                        |              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|----------------------------------------|--------------|
| DESIGN                                                                                                                                                                                                                          | CP                 | <b>DART AEROSPACE LTD</b>              |              |
| DRAWN                                                                                                                                                                                                                           | AJS                | HAWKESBURY, ONTARIO, CANADA            |              |
| CHECKED                                                                                                                                                                                                                         | <i>[Signature]</i> | DRAWING NO.                            | REV. B       |
| MFG. APPR.                                                                                                                                                                                                                      | <i>[Signature]</i> | D412-664-443                           | SHEET 4 OF 4 |
| APPROVED                                                                                                                                                                                                                        | <i>[Signature]</i> | TITLE                                  | SCALE        |
| DE APPR.                                                                                                                                                                                                                        | <i>[Signature]</i> | CROSSTUBE ASSEMBLY (412 HI AFT) NTS    |              |
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**skyservice****Work Order Traveler**

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|                |                               |               |                     |
|----------------|-------------------------------|---------------|---------------------|
| WO #: MWO34975 | Customer: Dart Aerospace Ltd. | Dept: NDT YUL | Reference: PO039037 |
| Descr:         | PN:                           | S/N:          | Qty: 1              |
| Make:          | Model:                        | Reg:          | A/C S/N:            |
| TSN:           | CSN:                          | TSO:          |                     |

|                          |             |
|--------------------------|-------------|
| Task: <b>UNSCHEDULED</b> | Sequence: 1 |
|--------------------------|-------------|

**Work Required:**

CARRY OUT NDT ON:

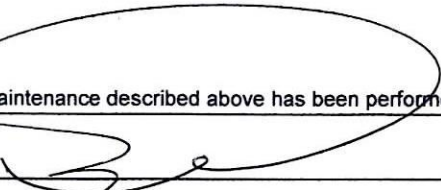
1 FUEL TANK ASSY P/N# D4464-041 , J/S# 170434

5 AFT CROSSTUBES , P/N# D412-664-403 , J/S# 171064, 171065, 171066, 171067, 171068

|                                                                                                                                             |             |                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Action Taken:</b>                                                                                                                        | Date:       | Initial/Stamp:                                                                                                                                                             |
| LPI C/O IAW ASTM E-1417M-13<br><br>NO CRACK FOUND<br><br>PEN. ZL-56, MPO13600, CLEANER SKC-S MPO13923 , DEV. MPO11715<br>, UV LIGHT M-20142 | FEB 14 2018 | <br> |

| Description | Location | P/N | Qty | Batch | S/N Off | S/N On |
|-------------|----------|-----|-----|-------|---------|--------|
|             |          |     |     |       |         |        |
|             |          |     |     |       |         |        |
|             |          |     |     |       |         |        |
|             |          |     |     |       |         |        |
|             |          |     |     |       |         |        |
|             |          |     |     |       |         |        |

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

|                                                                                                |                                                                                                        |                      |
|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|----------------------|
| Signature:  | ACA/SCA Stamp<br> | Date:<br>FEB 14 2018 |
| Name: <b>RAFIK MELIKIAN</b>                                                                    |                                                                                                        |                      |





Dart Aerospace Ltd.  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

# PURCHASE ORDER PO039037

**Supplier:** SKY002-VC  
Skyservice  
6120 Midfield Road  
Mississauga  
ON  
L5P 1B1 Canada  
Phone: 905-678-5636  
Fax: 905-678-5841

**PO No:** PO039037  
**PO Date:** 2/14/18  
**Due Date:**  
**Purchase Order  
Revision:**  
**Revision Date:**  
**Ship-To Contact:** Phone:

**Ship To:** 1270 Aberdeen Street  
Hawkesbury  
ON  
K6A 1K7 Canada  
Phone: 613-632-5200

**Via:** Ground  
**Pymt Terms:** Net 30  
**Freight Terms:**  
**Special Comments:**

## Items

| Line Item         | Job    | Part         | Description                                                                                                           | Status | Due Date | Order Quantity | Received Quantity | Balance | Unit Price (CAD) | Extended Price |
|-------------------|--------|--------------|-----------------------------------------------------------------------------------------------------------------------|--------|----------|----------------|-------------------|---------|------------------|----------------|
| 1                 | 170434 | D4464-041    | Fuel Tank Assembly<br>ISSUE P/O :<br>LIQUID PENETRANT INSPECTION AS<br>PER QSI 038 OR<br>LPI AS PER ASTM 1417 LEVEL 2 | Firmed |          | 1 pcs          | 0 pcs             | 1 pcs   | \$198.3333/pcs   | \$198.33       |
| 2                 | 171068 | D412-664-403 | 412 Stainless Steel Aft Crosstubes -<br>High<br>ISSUE P/O TO<br>ACCUREN:                                              | Firmed |          | 1 pcs          | 0 pcs             | 1 pcs   | \$198.3333/pcs   | \$198.33       |
|                   | 171067 |              |                                                                                                                       | Firmed |          | 1 pcs          | 0 pcs             | 1 pcs   | \$198.3333/pcs   | \$198.33       |
|                   | 171066 |              |                                                                                                                       | Firmed |          | 1 pcs          | 0 pcs             | 1 pcs   | \$198.3333/pcs   | \$198.33       |
|                   | 171065 |              |                                                                                                                       | Firmed |          | 1 pcs          | 0 pcs             | 1 pcs   | \$198.3333/pcs   | \$198.33       |
|                   | 171064 |              |                                                                                                                       | Firmed |          | 1 pcs          | 0 pcs             | 1 pcs   | \$198.3333/pcs   | \$198.33       |
| <b>Sub Total:</b> |        |              |                                                                                                                       |        |          | 5              | 0                 | 5       |                  | \$991.67       |

**Grand Total:** \$1,190.00

## Order Notes

Procurement Quality Clauses  
A005 right of entry  
A012 chemical and physical test report  
A016 personnel qualification  
A017 raw material identification (as applicable)

A022 Apical Processing  
A024 process certifications  
A026 certification of material conformance

A041 quality management system  
A042 dart notification by supplier  
A043 retension of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

PAGE 1 OF 1

**Description:** CROSSTUBE INSTALLATION, HEAVY DUTY, HIGH AFT

H:\Forms\Engineer\Approved Eng Online\CHGREC revB

DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____                                                                                                                                                                                                                                                                                                                                                                                                                                   | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                      | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Thermoforming <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/><br/>           Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/><br/>           Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Quality <input type="checkbox"/><br/>           Other <input type="checkbox"/> </div> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Date :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Step #:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | MRB (QSI042) Approval                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Description Work Order Deviation                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Completed By                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lead hand / Supervisor Approval Verification                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | QC / QA Coordinator Approval                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Root Cause                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | FAULT CATEGORY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Environment <input type="checkbox"/><br>Design <input type="checkbox"/><br>Doc/Data <input type="checkbox"/><br>Equip/Tooling <input type="checkbox"/><br>Handling/Pre <input type="checkbox"/><br>Material <input type="checkbox"/><br>Internal Transport <input type="checkbox"/><br>Tribal Knowledge <input type="checkbox"/><br>LOA <input type="checkbox"/><br>Substation <input type="checkbox"/><br>Past Expiry Date <input type="checkbox"/><br>Misidentified <input type="checkbox"/> | No Re-verification <input type="checkbox"/><br>Operator <input type="checkbox"/><br>Offset/Setup <input type="checkbox"/><br>Supplier <input type="checkbox"/><br>Training <input type="checkbox"/><br>Use for Testing <input type="checkbox"/><br>Poor Information <input type="checkbox"/><br>Rushing <input type="checkbox"/><br>Product Improvement <input type="checkbox"/><br>Process Improvement <input type="checkbox"/><br>Manufacturing Process <input type="checkbox"/><br>Past Due <input type="checkbox"/> | Pressure/Forced <input type="checkbox"/><br>Bending <input type="checkbox"/><br>Centre Not Concentric <input type="checkbox"/><br>Cracks <input type="checkbox"/><br>Crimp/Kink/Ripple/Wave <input type="checkbox"/><br>Cuffs <input type="checkbox"/><br>Crushing <input type="checkbox"/><br>Heat Treat <input type="checkbox"/><br>Wave/Twist in Tube <input type="checkbox"/><br>Marks/Chatter <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Temperature/Cure <input type="checkbox"/><br>Set-up <input type="checkbox"/><br>BOM/Route <input type="checkbox"/><br>Broken/Damage/Defect <input type="checkbox"/><br>Inspection Incomplete/Unqualified <input type="checkbox"/><br>Contamination <input type="checkbox"/><br>Countersink <input type="checkbox"/><br>Cut Too Short <input type="checkbox"/><br>Instructions Incomplete/Unclear <input type="checkbox"/><br>Drill Holes <input type="checkbox"/> | Power Loss/Surge <input type="checkbox"/><br>Folio/Program <input type="checkbox"/><br>Grain <input type="checkbox"/><br>Weld <input type="checkbox"/><br>Wrong Stock Pulled <input type="checkbox"/><br>Out of Sequence <input type="checkbox"/><br>Off-set <input type="checkbox"/><br>Misabeled <input type="checkbox"/><br>Fit/Function <input type="checkbox"/><br>Misaligned/off center <input type="checkbox"/> | Positioned Wrong <input type="checkbox"/><br>Outside Dimensions <input type="checkbox"/><br>Over/Under tolerance <input type="checkbox"/><br>Part Incorrect <input type="checkbox"/><br>Part Lost/Missing <input type="checkbox"/><br>Part Moved <input type="checkbox"/><br>Drawing <input type="checkbox"/><br>Finish <input type="checkbox"/><br>Misread <input type="checkbox"/><br>Turning Sequence <input type="checkbox"/> |
| OTHER : <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                   |